the top end of a dry Edwards air-pump *(a),* when there was only a moderate leakage of air, and (£) when the air-leakage was abnormal. The outside views in fig. 18 refer to an Edwards triple air-pump having three cranks set at 120° and driven by a directly-connected electric motor. Usually, however, the motor drive is by a pinion and gear-wheel, so that the motor can run at a high speed. The speed of rotation of the Edwards air-pump connected to a surface condenser is commonly as high as 250 r.p.m., but if working as a wet air-pump attached to a jet condenser, the speed would

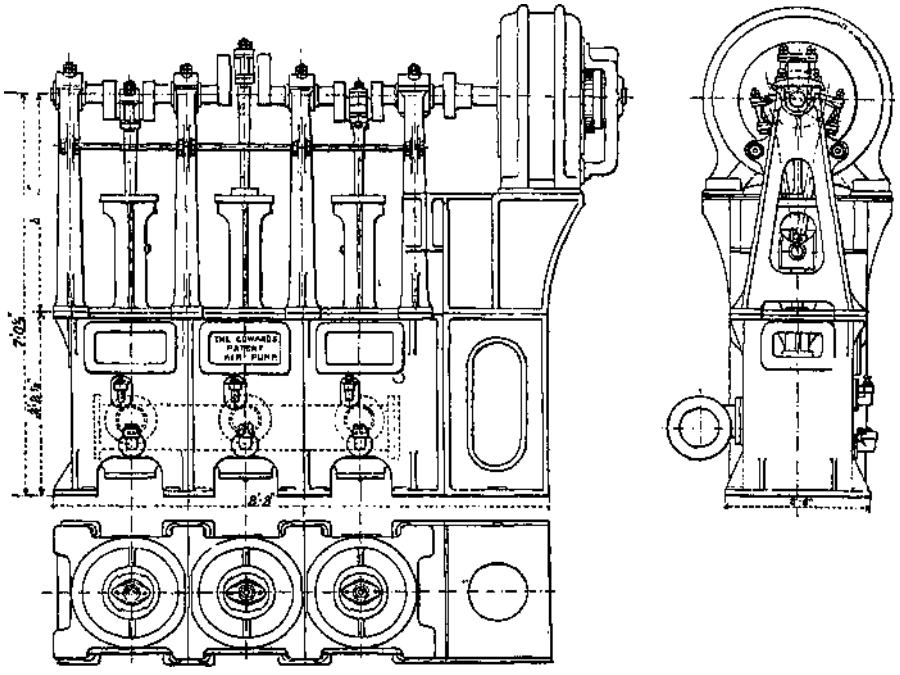

Fig. 18.—Edwards Triple Air-pump

perhaps not be more than half this value, because of the much greater volume of water to be discharged.

Fig. 19 shows a section through the cylinder of an independently-driven dry air-pump as made by The Mirrlees Watson Co., Ltd. The pump is driven either by steam or by an electric motor through a crank-shaft. The inlet of the air to the cylinder is controlled by the mechanically-operated slide-valve, and the ports are so arranged that when the piston reaches the end of its stroke, communication is made momentarily between the two ends of the cylinder, allowing an equalization of pressure. The air discharge is controlled by the voluntary opening

valves arranged in the cylinder ports.

The object of equalizing the pressure at the two ends of the cylinder at the end of each stroke is to improve the volumetric efficiency of the pump. Referring to the indicator diagram in fig. 20, A L is the atmosphere